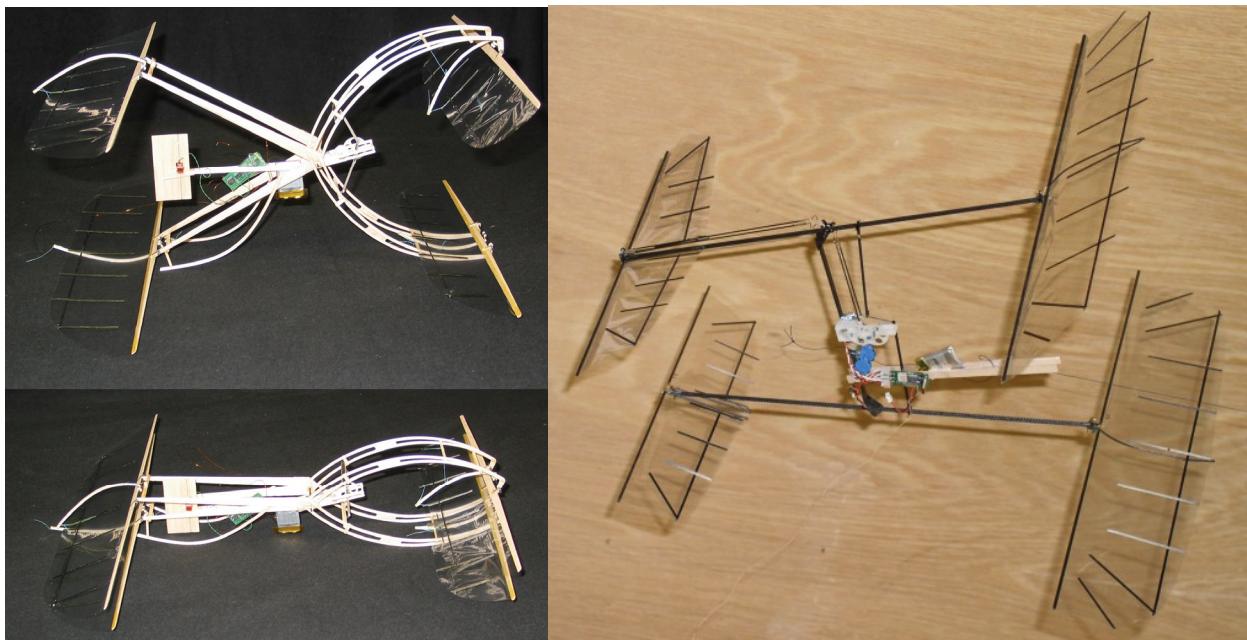


# BITE-Wing

## Biplane Insectoid Travel Engine



The BITE-Wing is a flapping-wing micro air vehicle with no fixed lifting surfaces. Two pairs of biplane-configured, reversing-camber flapping wings are driven in opposition by beams that resemble a pair of tongs. During their flapping cycle the wing pairs clap against each other, then are separated, producing rearward directed positive pressure pulses and forward directed negative pressure pulses that increase thrust. This technique has been observed in insect flight. The vehicle uses the same structure for flight, hover, hop takeoffs, and ground locomotion by "inchworming." Because the two beams are of equal mass and move in opposition, the BITE-Wing is dynamically balanced in flight.

Flapping wings can have aerodynamic advantages over conventional fixed wings and propellers for aircraft below 10 cm in size. The BITE-Wing experimental research vehicles shown are 40-50 cm long and weigh 20-30 grams. They are being used to develop flapping wing mechanisms that employ flight techniques similar to those of insects and birds. However, they take advantage of methods readily known to mechanical engineering, such as rotary motion and simple hinges, rather than attempt to mimic the complex musculature and skeletal structure of biology.

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